

What is claimed is:

1. A projection display apparatus configured to modulate light radiated from a lamp to project the modulated light, comprising:

5 a cooling element for cooling said lamp;

a time management section for managing time elapsed since turn-off of power supply to said lamp; and

a controller for controlling restart of said lamp after turn-off of said lamp, said controller turning on said lamp after causing said cooling element to cool said lamp when  
10 the temperature of said lamp is higher than a predetermined temperature, based on an output from said time management section, said controller turning on said lamp without causing said cooling element to cool said lamp prior to turn-on of said lamp when the temperature of said lamp is lower than said predetermined temperature, based on the output from said time management section.

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2. The projection display apparatus according to claim 1, wherein

said controller is configured to store information about whether the preceding turn-off of said lamp is normal or abnormal, and

for control of the restart of said lamp after the turn-off of said lamp, said  
20 controller immediately turns on said lamp when the preceding turn-off of said lamp is normal, and performs a judgment operation as to whether the temperature of said lamp is higher or lower than said predetermined temperature, based on the output from said time management section when the preceding turn-off of said lamp is abnormal.

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3. The projection display apparatus according to claim 1, wherein

said controller always performs a judgment operation as to whether the temperature of said lamp is higher or lower than said predetermined temperature, based on the output from said time management section, before turning on said lamp.

5           4. The projection display apparatus according to claim 1, wherein  
said controller changes a period of time that said cooling element cools said lamp, based on the output from said time management section.

10           5. The projection display apparatus according to claim 1, wherein  
said time management section includes a capacitor and a resistor, and is configured to charge said capacitor during a period of time that said lamp is on and to discharge said capacitor through said resistor during a period of time that said lamp is off.

15           6. The projection display apparatus according to claim 5, wherein  
setting is made so that the time required for an output voltage from said capacitor to reach a predetermined value by the discharge of said capacitor is equal in length to the time required for the temperature of said lamp allowed to cool down to reach said predetermined temperature.

20           7. The projection display apparatus according to claim 5, wherein  
said controller is configured to store information about whether the preceding turn-off of said lamp is normal or abnormal, and  
for control of the restart of said lamp after the turn-off of said lamp, said controller immediately turns on said lamp when the preceding turn-off of said lamp is  
25   normal, and performs a judgment operation as to whether the temperature of said lamp is

higher or lower than said predetermined temperature, based on the output voltage from said capacitor when the preceding turn-off of said lamp is abnormal.

8. The projection display apparatus according to claim 5, wherein  
5        said controller always performs a judgment operation as to whether the temperature of said lamp is higher or lower than said predetermined temperature, based on the output voltage from said capacitor, before turning on said lamp.

9. The projection display apparatus according to claim 5, wherein  
10       said controller changes a period of time that said cooling element cools said lamp, based on the output voltage from said capacitor.

10. The projection display apparatus according to claim 1, wherein  
      said time management section includes a timer IC for counting time, and is  
15    configured to start a counting operation of said timer IC at the time that said lamp turns off.

11. The projection display apparatus according to claim 10, wherein  
      for control of the restart of said lamp after the turn-off of said lamp, said  
20    controller judges that the temperature of said lamp is higher than said predetermined temperature when the time counted by said timer IC is shorter than predetermined time, and judges that the temperature of said lamp is lower than said predetermined temperature when the time counted by said timer IC is longer than said predetermined time.

12. The projection display apparatus according to claim 11, wherein  
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said predetermined time is set to be equal in length to the time required for the temperature of said lamp allowed to cool down to reach said predetermined temperature.

13. The projection display apparatus according to claim 10, wherein

5       said controller is configured to store information about whether the preceding turn-off of said lamp is normal or abnormal, and

          for control of the restart of said lamp after the turn-off of said lamp, said controller immediately turns on said lamp when the preceding turn-off of said lamp is normal, and performs a judgment operation as to whether the temperature of said lamp is  
10       higher or lower than said predetermined temperature, based on time data outputted from said timer IC when the preceding turn-off of said lamp is abnormal.

14. The projection display apparatus according to claim 10, wherein

          said controller always performs a judgment operation as to whether the  
15       temperature of said lamp is higher or lower than said predetermined temperature, based on time data outputted from said timer IC, before turning on said lamp.

15. The projection display apparatus according to claim 10, wherein

          said controller changes a period of time that said cooling element cools said  
20       lamp, based on time data outputted from said timer IC.